

Arrangement of appliances for process controlDescription

5 The invention relates to an arrangement of appliances with an information output. Appliances such as these are, for example, sensors or measurement devices which emit measurement values, or actuators which emit state data, in which case the output information can be  
10 passed on to another point.

Figure 2 shows one known typical arrangement. This shows a measurement arrangement in which a first element is the actual sensor 10 which is subject to the physical influence. A second element is an information transducer 11 which produces an analog or digital image of the physical effect. A transmitter 12 is used as a third element, and is required when transmission to a display 13 is intended. In an arrangement such as this,  
15 this results in a one-to-one association of the respective function with a detecting, processing, transmitting and display element. If a plurality of measurement arrangements are associated with one technical process, then at least the sensor 10,  
20 information transducer 11 and transmitter 12 are in each case required.  
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This also applies to active elements such as actuators, which pass on information relating to their state or activity. For example, a valve regulator signals either the "open" state or the "closed" state, and, in the case of a control valve, the incremental position change is also signaled.

Since all the components for each measurement point and  
35 each actuator in a process control system are used to record, process and pass on measurement values, this results in unnecessary redundancy. Production costs and complexity could be reduced if only the actually

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required components were included.

The invention is thus based on the object of specifying  
an arrangement which results in a reduction in the  
5 overall complexity.

This object is achieved by an appliance arrangement  
which has the features specified in claim 1.  
Advantageous refinements are specified in further  
10 claims.

The invention accordingly proposes that the hardware  
complexity in an arrangement of instruments or  
actuators which are associated with a technical process  
15 and require data interchange with a central point be  
reduced by not allocating a transmitter or a  
transmitting/receiving state to all of these  
appliances, but by using only one jointly used  
transmitting/receiving device. In addition to the  
20 saving, the arrangement has the advantage that it  
provides a capability for information preprocessing,  
plausibility checking and diagnosis.

The invention and its advantages will be described  
25 further in the following text with reference to one  
exemplary embodiment, which is illustrated in the  
drawing figures, in which:

Figure 1 shows an appliance arrangement according  
30 to the invention, and

Figure 2 shows an arrangement according to the  
prior art.

35 Figure 1 shows an arrangement of appliances 2a, 2b, 2c  
and 2d, which are associated with a technical process 1  
for open-loop and closed-loop control. The appliances  
2a, 2b, 2c, 2d are, for example, instruments or

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actuators, but in any case appliances which require communication with a central point 4. In contrast to the arrangement shown in Figure 2, the appliances 2a, 2b, 2c, 2d do not, however, have any means for direct  
5 communication with the central point 4. A transmitter/receiver 3 is provided for communication with the central point 4, and can be associated with one of the appliances 2a, 2b, 2c, 2d. With regard to processing performance, memory capacity and  
10 transmission bandwidth, the transmitter/receiver 3 is designed to handle all the amounts of data which occur from all of the appliances 2a, 2b, 2c, 2d. The central point 4 may, for example, be a process control console, or its control station.

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The transmitter/receiver 3 is connected to all of the appliances 2a, 2b, 2c, 2d and is designed to read the data from them either simultaneously or successively, to digitize the data if required, and to transmit it to  
20 the central point 4 using a suitable transmission protocol.

Since, in addition to instruments, actuators can also be connected to the transmitter/receiver 3,  
25 plausibility checks and diagnoses can be carried out without connection to a central point, in addition to preprocessing of so-called raw data. By way of example, a valve regulator can thus pass on information relating to the valve position to adjacent flowmeters, which  
30 themselves signal back whether the "valve closed" signal also actually results in "zero" flow.

The expressions "transmitter", "transmitter/receiver" as well as "send" as used above generally represent a  
35 "transmission unit" or "transmission", that is to say they are used both for wire-free and wire-based data interchange. Examples of this are fieldbus systems, Ethernet or the HART protocol.